



# UNITED STATES PATENT AND TRADEMARK OFFICE

cel

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/922,748	08/07/2001	Norihiko Moriwaki	HITA-0093	9584

7590 07/27/2005

Stanley P. Fisher  
Reed Smith Hazel & Thomas LLP  
3110 Fairview Park Drive, Suite 1400  
Falls Church, VA 22042-4503

EXAMINER

KHUONG, LEE T

ART UNIT PAPER NUMBER

2665

DATE MAILED: 07/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/922,748

Applicant(s)

MORIWAKI ET AL.

Examiner

Lee Khuong

Art Unit

2665

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2,4,6,9,11 and 13-15 is/are pending in the application.
- 4a) Of the above claim(s) 1,3,5,7,8,10 and 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) 2,4 and 6 is/are allowed.
- 6) ☒ Claim(s) 9, 11, 13-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Momirov (US 6,484,209) in view of Lau (US 6,052,373).

**Regarding claim 9,** Momirov discloses An Efficient Path Based Forwarding And Multicast Forwarding. Momirov discloses a method of transmitting a multicast packet at a packet switching apparatus (Fig. 2, 200, *a switching device*), which comprises:

n (an integer of 3 or more) slots (Fig. 2, 220, *a plurality of I/O cards*) capable of housing line interface cards to each of which an input line (Fig. 2, 240, *an ethernet input port*) and output line (Fig. 2, 240, *an ethernet output port*) are connected (see col. 4, lines 21-23, *a plurality of I/O cards, 220, can be housed in a switching device, 200 and connected via buses, 216*); and

a packet switch (Fig. 2, 200), the method comprising the steps of: in each of the plural interface cards housed in the plural slots, outputting a multicast packet added with a bitmap (*a forwarding control information which could be a multicast group identifier*, see col. 9, lines 18-21, lines 44-45, *the forwarding control information is inserted into packet/cell headers*); and

Art Unit: 2665

in the packet switch, multicasting the multicast packets to plural line interface cards of the k line interface cards housed in the plural slots specified in the bitmap (see col. 9, lines 41-54, *the multicast cell is forwarded to the appropriate I/O cards based on a multicast group identifier*).

Momirov does not disclose expressly the step of in each of plural interface cards housed in plural slots of the n slots deciding the length of a bitmap added to a multicast packet, depending on the number of the housed line interface cards, wherein each of the line interface cards housed in the plural slots brings the length of the bitmap to n bits when the number of the housed interface cards is equal to n, and in other cases, makes the length of the bitmap smaller than n bits.

However, the length of the bitmap is made variable depending on the value of the plural interface cards housed in plural slots in a switch is well known in the art for grouping line cards for providing a fast and scalable switching system as evidenced by Lau.

Lau discloses a variable length bitmap to n bits depending on the number of line interface cards housed in the plural slots of the switch and in other cases, makes the length of the bitmap smaller than n bits (see Fig. 5, col. 6, line 49 – col. 7, line 7, *the total number of multicast patterns is the sum of all destination patterns which is depending on the number of k destination SPCs from which makes up the required length of the bitmap*).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the multicast bitmap method of Lau with Momirov.

Art Unit: 2665

The suggestion/motivation for doing so would have been to provide a fast, reliable and scalable switching system (see col. 2, line 66 – col. 4, line 17).

Therefore, it would have been obvious to combine Lau with Momirov to partially obtain the invention as specified in claim 9.

3. Claims 11, 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Momirov in view of Lau and further in view of Long et al. (US 6,728,238), hereinafter referred as Long.

**Regarding claim 11**, Momirov and Lau disclose all claimed limitations set forth in the rejection of claim 9 except a control part for controlling the k line interface cards and the packet switch; and a management terminal connected to the control part, wherein the value of k is inputted from the management terminal.

However, a management terminal to configure/setup/monitor (control part) for a switch is well known in the art for providing administrative and maintaining tasks on the switch as evidenced by Long.

Long discloses a management terminal (Fig. 3, 114, admin terminal) and a control part (Fig. 3, 114) for controlling the k line interface cards (Fig. 3, 102, *a plurality of line cards*, see col. 10, lines 61-66), wherein the value of k is inputted from the management terminal (see col. 11, lines 1-12).

Therefore at the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine Long's management terminal with Momirov and Lau's switch.

Art Unit: 2665

The suggestion/motivation for doing so would have been to provide a mean to admin and maintain the switch fabric (see col. 11, lines 1-12).

**Regarding claims 13, 14 and 15,** Momirov discloses An Efficient Path Based Forwarding And Multicast Forwarding. Momirov discloses a setup method of transmitting a packet switching apparatus (Fig. 2, 200, *a switching device*), which comprises:

n (an integer of 3 or more) slots (Fig. 2, 220, *a plurality of I/O cards*) capable of housing line interface cards to each of which an input line (Fig. 2, 240, *an ethernet input port*) and output line (Fig. 2, 240, *an ethernet output port*) are connected (see col. 4, lines 21-23, *a plurality of I/O cards, 220, can be housed in a switching device, 200 and connected via buses, 216*); and

a packet switch (Fig. 2, 200), the method comprising the steps of: in each of the plural interface cards housed in the plural slots, outputting a multicast packet added with a bitmap (*a forwarding control information which could be a multicast group identifier*, see col. 9, lines 18-21, lines 44-45, *the forwarding control information is inserted into packet/cell headers*); and

in the packet switch, multicasting the multicast packets to plural line interface cards of the k line interface cards housed in the plural slots specified in the bitmap (see col. 9, lines 41-54, *the multicast cell is forwarded to the appropriate I/O cards based on a multicast group identifier*).

Momirov does not disclose expressly the steps of: inputting the number of line interface cards housed in plural slots of the  $n$  slots from a management terminal; and depending on the inputted number of line interface cards, in each of plural interface cards housed in plural slots, controlling the length of a bitmap added to a multicast packet, wherein each of the plural interface cards housed in the plural slots performs control so that the length of the bitmap is  $n$  bits when the number of the housed interface cards is equal to  $n$ , and in other cases, makes the length of the bitmap smaller than  $n$  bits.

However, the length of the bitmap is made variable depending on the value of the plural interface cards housed in plural slots in a switch is well known in the art for grouping line cards for providing a fast and scalable switching system as evidenced by Lau.

Lau discloses a variable length bitmap to  $n$  bits depending on the number of line interface cards housed in the plural slots of the switch and in other cases, makes the length of the bitmap smaller than  $n$  bits (see Fig. 5, col. 6, line 49 – col. 7, line 7, *the total number of multicast patterns is the sum of all destination patterns which is depending on the number of  $k$  destination SPCs from which makes up the required length of the bitmap*).

Lau disclose a multicast packet of the plural line interface cards housed in the plural slots is multicast to only specific plural line interface cards of the plural line interface cards housed in the plural slots, inputting information for identifying the specific plural line interface cards (Fig. 5, see col. 6, line 49 – col. 7, line 7, *each “1” bit in the  $n$ -bits represents the line card, the multicast cell to be forwarded to*).

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the multicast bitmap method of Lau with Momirov.

Art Unit: 2665

The suggestion/motivation for doing so would have been to provide a fast, reliable and scalable switching system (see col. 2, line 66 – col. 4, line 17).

Therefore, it would have been obvious to combine Lau with Momirov to partially obtain the invention as specified in claims 13, 14 and 15.

Momirov and Lau together do not disclose a management terminal is connected to the packet switching apparatus to inputting the number of line interface cards housed in plural slots of the n slots from the management terminal.

However, a management terminal to configure/setup/monitor/control the number of line interface cards for a switch is well known in the art for providing administrative and maintaining tasks on the switch as evidenced by Long.

Long discloses a management terminal (Fig. 3, 114, admin terminal) and a control part (Fig. 3, 114) for controlling the k line interface cards (Fig. 3, 102, *a plurality of line cards*, see col. 10, lines 61-66), wherein the value of k is inputted from the management terminal (see col. 11, lines 1-12).

The suggestion/motivation for doing so would have been to provide a mean to admin and maintain the switch fabric (see col. 11, lines 1-12).

Therefore, it would have been obvious to combine Long's management terminal with Momirov and Lau's switch to obtain the invention as specified in claims 13, 14 and 15.

***Allowable Subject Matter***

4. Claims 2, 4 and 6 are allowed.



Art Unit: 2665

5. The following is a statement of reasons for the indication of allowable subject matter: regarding claims 2, 4 and 6, the prior arts fail to expressly teach each of the k line interface cards brings the length of the bitmap to n bits when  $k = n$ , and makes the length of the bitmap smaller than n bits when  $k < n$ .

### *Response to Arguments*

6. Applicant's arguments with respect to claims 9, 11, 13-15 have been considered but are moot in view of the new ground(s) of rejection.

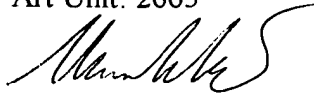
### *Conclusion*

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lee Khuong whose telephone number is 571-272-3157. The examiner can normally be reached on 9AM - 5PM.

8. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on 571-272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

9. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

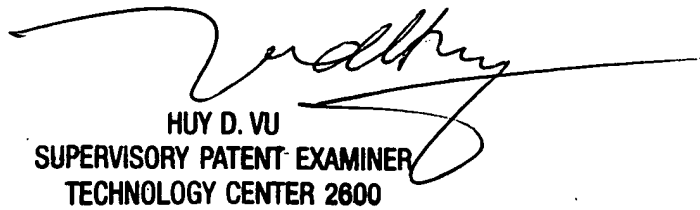
Art Unit: 2665



Lee T. Khuong

Examiner

Art Unit 2665



HUY D. VU  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600